

**PATENT**

Atty. Dkt. AMAT/3032.C7/DSM/LOWK/JW  
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**WHAT IS CLAIMED IS:**

1. A method for depositing a low dielectric constant film on a substrate, comprising reacting two or more organosiloxanes, wherein at least one of the organosiloxanes is a cyclic organosiloxane comprising C, H, and O, while applying RF power, wherein the low dielectric constant film comprises silicon-carbon bonds and a dielectric constant of about 3 or less.
2. The method of claim 1, wherein the at least one cyclic organosiloxane comprising C, H, and O comprises a ring comprising oxygen.
3. The method of claim 2, wherein the at least one cyclic organosiloxane comprising C, H, and O is selected from the group consisting of 1,3,5,7-tetramethylcyclotetrasiloxane and octamethylcyclotetrasiloxane.
4. The method of claim 1, wherein the two or more organosiloxanes are selected from the group consisting of 1,3,5,7-tetramethylcyclotetrasiloxane, octamethylcyclotetrasiloxane, 1,3,5,7,9-pentamethylcyclopentasiloxane, and 1,3,5,7-tetrasilano-2,6-dioxy-4,8-dimethylene.
5. The method of claim 1, wherein the two or more organosiloxanes are reacted with an oxidizing gas.
6. The method of claim 5, wherein the oxidizing gas is selected from the group consisting of oxygen, ozone, nitrous oxide, carbon dioxide, and water.
7. The method of claim 1, wherein the RF power is pulsed to increase the porosity of the film.
8. A method for depositing a low dielectric constant film on a substrate, comprising reacting two or more organosilanes, wherein at least one of the organosilanes is a

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cyclic organosilane, while applying RF power, wherein the low dielectric constant film comprises silicon-carbon bonds and a dielectric constant of about 3 or less.

9. The method of claim 8, wherein the cyclic organosilane is 1,3,5-trisilano-2,4,6-trimethylene.

10. The method of claim 9, wherein the two or more organosilanes further comprise an organosilane selected from the group consisting of methylsilane, dimethylsilane, trimethylsilane, dimethylsilanediol, ethylsilane, phenylsilane, diphenylsilane, diphenylsilanediol, methylphenylsilane, disilanomethane, bis(methylsilano)methane, 1,2-disilanoethane, 1,2-bis(methylsilano)ethane, and 2,2-disilanopropane.

11. The method of claim 8, wherein the two or more organosilanes are reacted with an oxidizing gas.

12. The method of claim 11, wherein the oxidizing gas is selected from the group consisting of oxygen, ozone, nitrous oxide, carbon dioxide, and water.

13. The method of claim 8, wherein the RF power is pulsed to increase the porosity of the film.

14. The method of claim 8, wherein at least one of the two or more organosilanes comprises oxygen.

15. A method for depositing a low dielectric constant film on a substrate, comprising reacting two or more organosiloxanes, wherein a first organosiloxane of the two or more organosiloxanes is cyclic and comprises C, H, and O and a ring comprising carbon and oxygen, while applying RF power, wherein the low dielectric constant film comprises silicon-carbon bonds and a dielectric constant of about 3 or less.

16. The method of claim 15, wherein the first organosiloxane is 1,3,5,7-tetrasilano-2,6-dioxy-4,8-dimethylene.

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17. The method of claim 15, wherein a second organosiloxane of the two or more organosiloxanes is selected from the group consisting of 1,3-dimethyldisiloxane, 1,1,3,3-tetramethyldisiloxane, hexamethyldisiloxane, 1,3-bis(silanomethylene)disiloxane, bis(1-methyldisiloxanyl)methane, 2,2-bis(1-methyldisiloxanyl)propane, 1,3,5,7-tetramethylcyclotetrasiloxane, octamethylcyclotetrasiloxane, and 1,3,5,7,9-pentamethylcyclopentasiloxane.

18. The method of claim 15, wherein the two or more organosiloxanes are reacted with an oxidizing gas.

19. The method of claim 18, wherein the oxidizing gas is selected from the group consisting of oxygen, ozone, nitrous oxide, carbon dioxide, and water.

20. The method of claim 15, wherein the RF power is pulsed to increase the porosity of the film.